

Appl. No. 10/711,145
Amdt. Dated 11/14/2006
Reply to Office action of September 15, 2006

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) Method of forming an interconnect structure comprising the steps of:
depositing a dielectric layer of ultra low-k material;
forming a hard mask over the layer of dielectric material, wherein the hard mask comprises:
a layer of silicon carbide (SiCOH) material overlying the dielectric layer; and
a layer of oxide material overlying the silicon carbide material;
etching trenches in the dielectric material;
depositing a liner material over the hard mask and within the trenches; and
overfilling the trenches with a conductive material;
performing a first chemical mechanical polishing process to remove conductive material
which is atop the liner, thereby exposing the liner;
removing that portion of the liner which is atop the hard mask using ~~a process selected from
the group consisting of reactive ion etch (RIE) and a Gas Cluster Ion Beam (GCIB)~~, leaving
conductive material protruding from the trenches; and
removing the layer of oxide material using a wet etch process, leaving the layer of silicon
carbide and leaving conductive material and liner material above the layer of silicon carbide
(SiCOH) material protruding from the trenches, followed by performing a touch-up polishing
process to remove conductive material and liner material protruding from the trenches.
2. (cancel)
3. (cancel)
4. (Currently Amended) The method of claim 1, wherein:
the layer of silicon carbide material has a thickness in the range of 1000-5000Å.
the layer of oxide material has a thickness in the range of 1000-5000Å.

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5. (original) The method of claim 1, wherein the conductive material is copper.

6. (cancelled)

7. (cancelled)

8. (cancelled)

9. (Currently Amended) The method of claim 1, further comprising the step of:
ensuring that the layer of oxide material is thick enough such that the topographical variations after the first chemical mechanical polishing process and liner removal are entirely within the oxide portion of the hard mask.

10. (Currently Amended) The method of claim 1, wherein the layer of oxide material has a thickness in the range of 50 – 5000Å.

11. (previously presented) The method of claim 1, wherein the layer of silicon carbide material has a thickness in the range of 50 – 5000Å.

12. (canceled)

13. (previously presented) The method of claim 1, wherein the touch-up polishing process comprises using an abrasive-free or low-abrasive polish to obtain a very high selectivity between the conductive material and the second portion of the hard mask.

Cancel claims 14-28